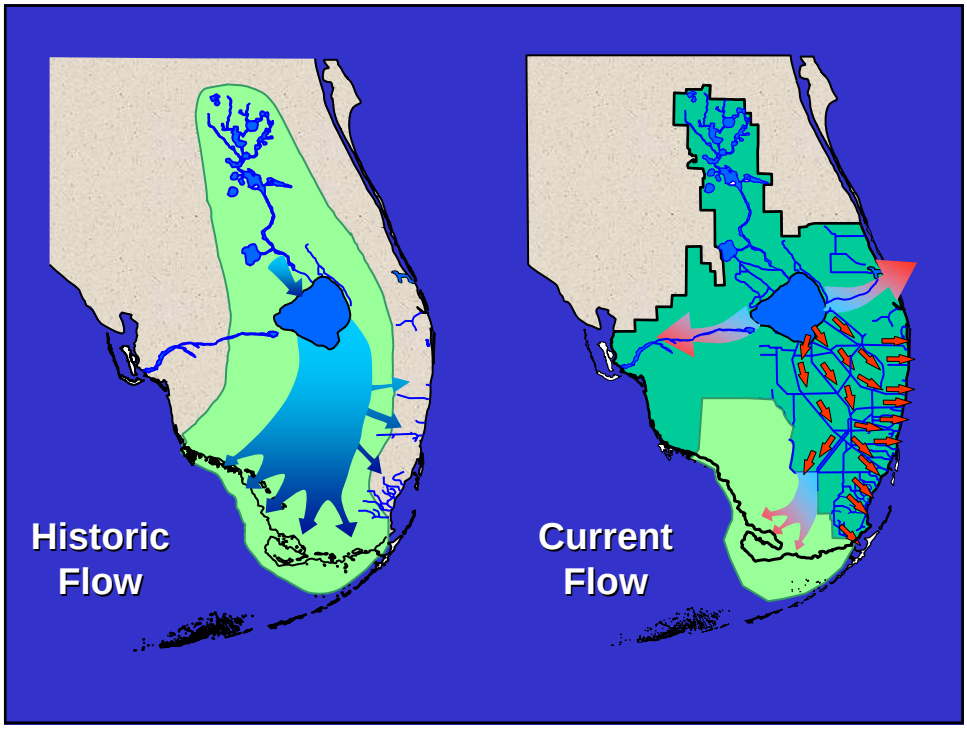
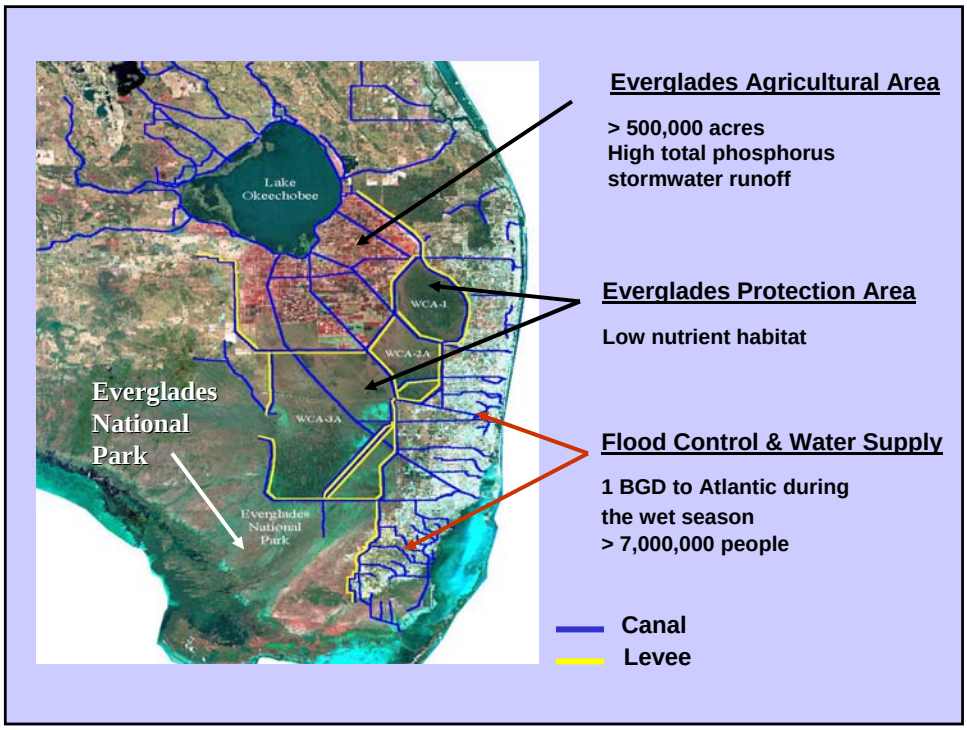
Outline

- Treatment Wetlands in Florida
- Everglades Construction Project
- ECP Lessons Learned
- Implications for the Salton Sea
- Treatment Challenges


Historic
Flow
Current
Flow


Lake
Okeechobee
WCA-1
WCA-2A
WCA-3A
Everglades
National
Park
Everglades
National
Park
Everglades Agricultural Area
> 500,000 acres
High total phosphorus
stormwater runoff
Everglades Protection Area
Low nutrient habitat
Flood Control & Water Supply
1 BGD to Atlantic during
the wet season
> 7,000,000 people
Canal
Levee

Treatment Wetlands in Florida

Mitigation Wetlands
5 to 80 acres (wetland treatment area)

Phosphate Reclamation Wetlands
100 to 1,500 acres

Everglades Stormwater Treatment Wetlands
6,000 to 17,000 acres
41,418 total treatment acres

Everglades Construction Project

Everglades Forever Act

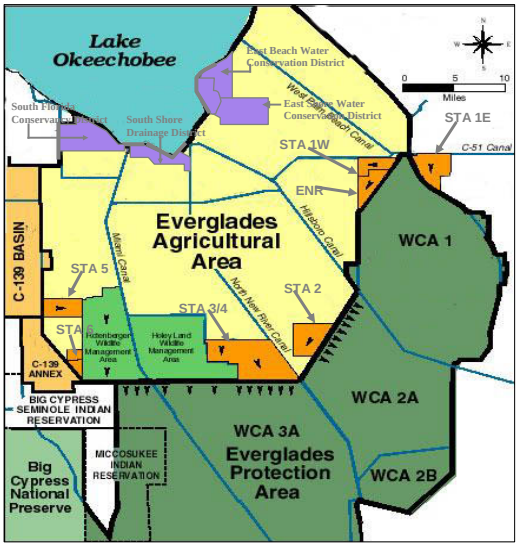
- **Budget - tax dollars**
  - **Ad valorem & Ag tax = $850,000,000**
- **Schedule (1994 - 2003)**
  - **10 years**
  - **Concept to operation**
- **Performance levels (phosphorus reduction)**
  - **Average inflow conc 120 ppb**
  - **Phase 1 target - outflow conc 50 ppb**
  - **Phase 2 - ultimate goal 10 ppb entering Everglades**

Everglades Construction Project

Stormwater Treatment Areas

- **45,000 acres in 6 wetlands**
  Treatment area
- **1,893,000 ac-ft of inflow annually**
  Stormwater and Lake releases
- **35,000 cfs pumping capacity**
  Moving water in & out of STA
- **180 miles of canals and levees**
  Internal and external conveyance

Everglades Construction Project



STA-1W	6,670 acres
STA-2	6,430 acres
STA-5	4,118 acres
STA-6	870 acres
STA-1E	5,350 acres
STA-3/4	16,480 acres

Total Treatment area
39,918 acres

Total Land area
45,218 acres

Schedule
1994 - 2003
design to operation

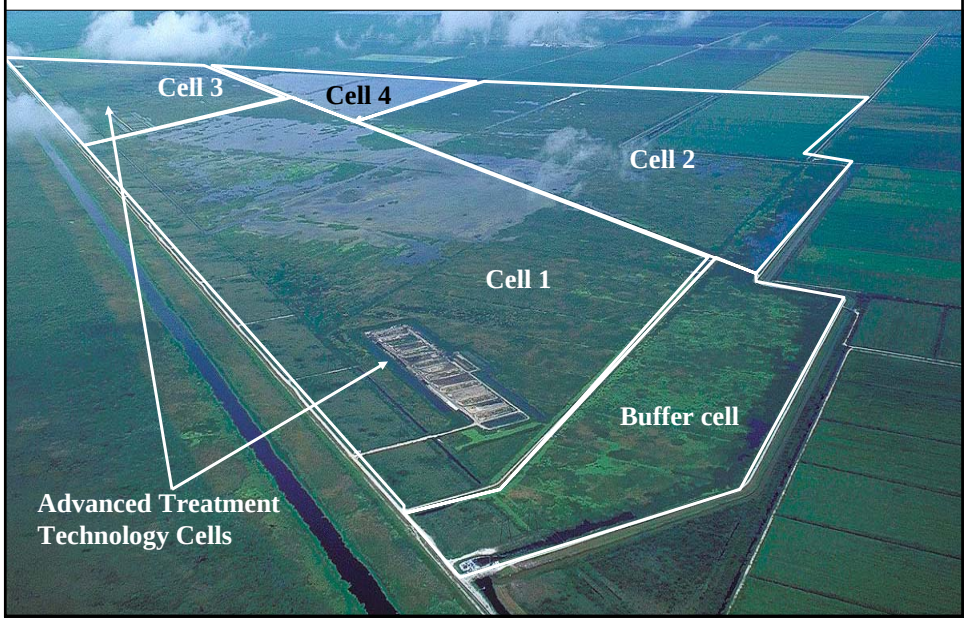
Budget
$850,000,000

Everglades Nutrient Removal (ENR) Project

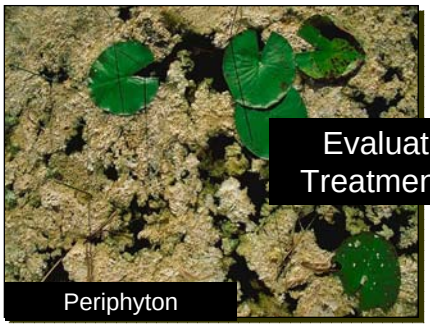
- 4,015 acres
- 4 cells
- 163 mgd
- TP in = 100 µg/L
- TP out = 25 µg/L
- $14,000,000 (1993)
- Started August 1994
- Expanded to STA-1W in 1999 - Total 6,670 acres

Everglades Nutrient Removal Project

4 cells - 4,000 ac



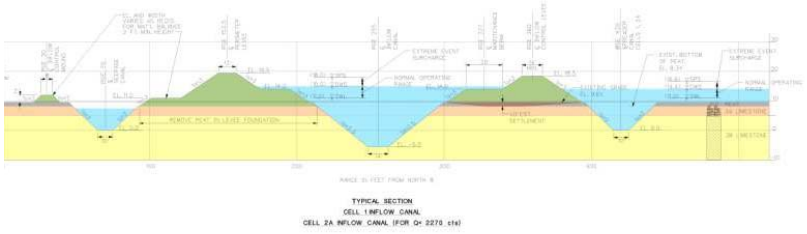
Stormwater Treatment Area Research



Evaluating Advanced Treatment Technologies

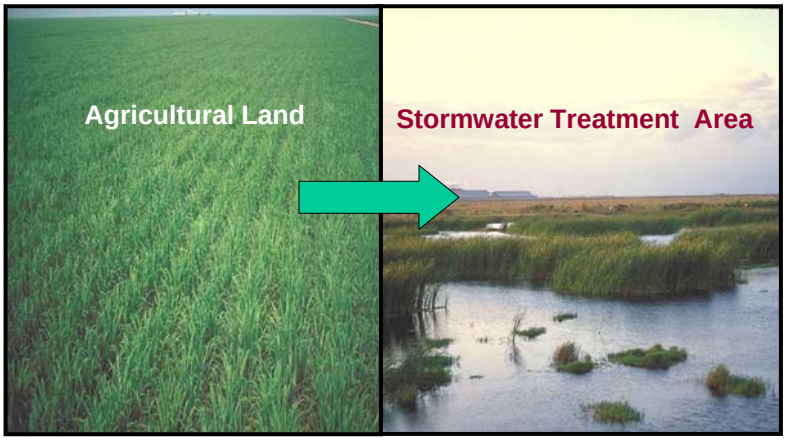
Stormwater Treatment Area Design

Seepage Canal **Inflow Canal** **Wetland Treatment Cell**



TYPICAL SECTION
CELL 1 INFLOW CANAL
CELL 2A INFLOW CANAL (FOR Q= 2270 cfs)

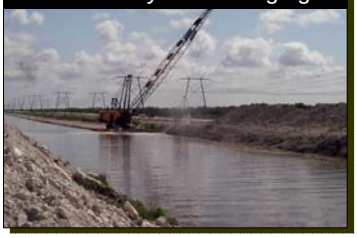
Stormwater Treatment Area Design



Phosphorus Reduction

Design target:	**50 ppb**
Since 1994, prototype has consistently achieved:	**<25 ppb!**

Canal conveyance dredging



Intra-cell water control structures

Stormwater Treatment Area Construction

High flow - Gated water control structures

Large pump stations required